Title: Histopathologic and immunohistochemical characterization of antioxidants profiles in different compartments in severe COPD

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Body: Background: Reactive oxygen/nitrogen species (ROS/RNS) are generally acknowledged as potent immunoregulatory and tissue-destructive molecules in tobacco-induced COPD. The excessive ROS/RNS are rapidly scavenged by the primary-line-antioxidants: superoxide dismutases (SODs), catalase (CAT), and glutathione peroxidase. The thioredoxin (TRX) system plays decisive role in the maintenance of a reduced intracellular redox state. However, there is little known about the detailed interrelationships between antioxidants profiles and proliferative(PI), inflammatory-(II), destructive-index (DI) in small airways/lung in the same individual. Methods: The micro-localizations of macrophages (MQ), mast cells, neutrophils, SODs (CuZn-SOD, Mn-SOD, EC-SOD), catalase (CAT), thioredoxin (TRX) were investigated by immunocytochemistry using paraffin-embedded lung sections from non-smokers (n=10) and COPD patients (n=10). Histological/immunohistochemical analyses were performed using the same Region-of-Interest (ROI: well-preserved bronchiolar epithelium, pulmonary vessels, alveolar tissue) for each subject. Results: The percentage of CuZn-SOD/TRX immunoreactivity was significantly higher (p<0.05) in bronchiolar epithelium, pulmonary vessels in severe COPD, whereas epithelial Mn-SOD/EC-SOD expressions were less affected. DI/II showed a positive statistic correlation with immunoreactivity for CuZn-SOD/CAT, and TRX. PI showed an increased immunoreactivity for Mn-SOD and CAT in the same section. In summary, our results indicate an increase expression and upp-down regulation of antioxidants in the same subject and correlates with the local-regional severity of COPD.